

Women and Ischemia Syndrome Evaluation (WISE) Diagnosis and Pathophysiology of Ischemic Heart Disease Workshop

October 2-4, 2002

Session 5

1. Topic and Author

Cost-effective strategies to risk (Mark Hlatky)

2. Where we stand in 2002. Overview/rationale for inclusion of topic.

Optimal use of tests to diagnose coronary artery disease, assess risk of coronary events, or both, has been difficult to assess and controversial. Gender specific recommendations for the use of tests add an additional layer of complexity.

There is evidence that diagnostic test performance is affected by gender. The largest effect of gender is on the prevalence of coronary disease (equivalent to the pre-test probability), which is lower in women at any given age as a result of the later onset of coronary disease in women. The lower pre-test probability generally leads to a lower positive predictive value of a positive test result.

The sensitivity, specificity, or both of a diagnostic test may be affected by gender. These variations may be mediated through gender differences in response to exercise or pharmacological stress, or by gender specific effects on detection of evidence of coronary disease (ischemia, coronary calcification or obstruction).

Assessing the cost-effectiveness of diagnostic test strategies is challenging. Ideally alternative strategies should be compared using randomized clinical trials. Several trials have compared the strategy of routine coronary angiography with the strategy of non-invasive testing and selective angiography in patients with acute coronary syndromes. Results of four recent trials are heterogeneous, and results in subgroup analyses by gender are inconsistent.

Decision models have been used to simulate the effects of alternative testing strategies. These models are based on synthesis of the literature on test performance, treatment effectiveness, and clinical outcomes. The conclusions are sensitive to the limitations of available data, yet important such models have provided insights about the use of tests. The cost-effectiveness of diagnostic testing strategies is critically dependent on how the results of tests are used to alter therapy, and the extent to which the changes in therapy lead to improvements in clinical outcomes (i.e. reductions in mortality, non-fatal myocardial infarction, and symptoms).

Decision models suggest that the cost-effectiveness of non-invasive tests for coronary disease depend on the pre-test probability of disease (for diagnosis) or of clinical events (for risk stratification). At the lowest levels of pre-test probability, the optimal strategy is usually to perform no tests. At intermediate levels of pre-test probability, a non-invasive testing strategy is usually the most cost-effective choice. Above some threshold of pre-test probability coronary angiography becomes the most cost-effective approach. The choice among the many non-invasive test options depends on the cost of the test (including the costs of any complications and follow-up testing) and the parameters of test performance.

3. Current challenges and the most important issues for future research

Limited data exist on how the effectiveness and cost of non-invasive tests or of interventions depend on gender and other clinical factors (e.g. age). Direct comparisons of the value of two or more tests in the same patient population are needed to judge the relative efficacy and cost-effectiveness of alternative testing strategies.

4. Current challenges in the areas of communicating messages to health care community, patients and the public

There are so many options for diagnosis and treatment that the analyses are confusing and complex. Clear recommendations based on compelling data are needed.

5. Translating new findings to improved diagnosis and treatment/saving lives.

Better risk assessment tools will allow more refined recommendations.

6. References.

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